<u>Claims</u>

1. Method for producing silicon nitride film by chemical vapor deposition, characterized by feeding gaseous aminosilane with formula (I)

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$$(H)_n - Si - (N(R)_2)_{4-n}$$
 (1)

(each R is independently selected from the hydrogen atom, C_{1-4} alkyl, and the trimethylsilyl group and n is an integer with a value of 0-3, wherein the groups \ddot{R} are not all simultaneously a hydrogen atom)

and gaseous hydrazine compound with formula (II)

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$$N_2(H)_{4-x}(R^1)_x$$
 (II)

(each R^1 is independently selected from methyl, ethyl, and phenyl and ${\bf x}$ is an integer with a value of 0-4)

into a chemical vapor deposition reaction chamber that holds at least one substrate, and

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- forming silicon nitride film on said at least one substrate by reacting the two gases in the chemical vapor deposition reaction chamber.
- 2. The method described in Claim 1, characterized in that the reaction is run at temperatures of 300°C to 650°C.

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- 3. The method described in Claim 1 or 2, characterized in that the pressure in the reaction chamber is established at 0.1-1000 torr.
- 4. Method as described in any of Claims 1-3, characterized in that the aminosilane:
 25 hydrazine compound molar ratio is 1:1 to 1:100.
 - 5. Method for producing silicon oxynitride film by chemical vapor deposition, characterized by

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feeding gaseous aminosilane with formula (I)

$$(H)_n - Si - (N(R)_2)_{4-n}$$
 (I)

(each R is independently selected from the hydrogen atom, C_{1-4} alkyl, and the trimethylsilyl group and \mathbf{n} is an integer with a value of 0-3, wherein the groups R are not all simultaneously a hydrogen atom),

gaseous hydrazine compound with formula (II)

$$N_2(H)_{4-x}(R^1)_x$$
 (II)

(each R^1 is independently selected from methyl, ethyl, and phenyl and ${\bf x}$ is an integer with a value of 0-4), and oxygenated gas

into a chemical vapor deposition reaction chamber that holds at least one substrate, and $\underline{\ }$

forming silicon oxynitride film on said at least one substrate by reacting these gases in the chemical vapor deposition reaction chamber.

- 6. The method described in Claim 5 for producing silicon oxynitride film, characterized in that the oxygenated gas is at least one selection from the group consisting of O₂, O₃, H₂O, H₂O₂, NO, NO₂, and N₂O.
- 7. The method described in Claim 5 or 6, characterized in that the reaction is run at temperatures of 300°C to 650°C.
 - 8. Method as described in any of Claims 5-7, characterized in that the pressure in the reaction chamber is established at 0.1-1000 torr.
- 9. Method as described in any of Claims 5-8, characterized in that the aminosilane: hydrazine compound molar ratio is 1:1 to 1:100.

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10. Method as described in any of Claims 5-9, characterized in that the aminosilane : oxygenated gas molar ratio is 1 : 1 to 1 : 100.